Chapter 2 Existing Facility

2.1 Route 99 Background

Route 99 first became a State highway in 1909, designated as Legislative Route Number 4. It was paved in about 1913-1914 and in the 1920's was redesignated as U.S. 99 and "The Golden State Highway." Some segments of U.S. 99 were widened to 3 lanes in the 1930's. This led to head-on collisions in the middle lane, which was intended for passing and turning. U.S. 99 was gradually widened to a 4-lane expressway during the 1930's, 40's, and 50's. The widening was often done on new alignments, frequently bypassing towns. The last 3-lane section of U.S. 99 became a 4-lane expressway in May 1960.

During the 1960's, the black and white U.S. 99 shields gave way to the familiar green CA-99 signs shaped like miners' spades. Since that time, most areas have been upgraded to freeway by closing at-grade intersections, or replacing them with interchanges. The last stoplight on Route 99 in the San Joaquin Valley was eliminated by the Livingston Bypass project in 1996.[2]

Today, most of the 274-mile segment covered by the Business Plan is a 4- or 6-lane freeway. Only 23 miles in Madera and Merced counties are considered "freeway gaps" and Caltrans currently has four programmed projects which, upon completion, will convert these remaining segments to full access-controlled freeway.

Since the 1910's when Route 99 was first developing as a State highway, agricultural improvements—especially irrigation—have led to significantly greater crop yields. Transporting these valued commodities to market has made Route 99 an even more vital economic link. Changes in "on-time delivery" of goods has led to higher truck volumes on the route. Rapid population growth over several decades has also led to more traffic and a greater dependence on Route 99.

The Annual Daily Traffic (ADT) ranges from a current level of 42,000 vehicles near Interstate 5 in Kern County to over 100,000 vehicles in Bakersfield, Fresno, Modesto, and Stockton. The projected traffic volume in 2025 is from 84,000 to 260,000 vehicles. Truck traffic accounts for anywhere from 19 percent in the Ceres area to nearly 27 percent in southern Kern County near Interstate 5. The statewide average for truck volumes by segment is about 9 percent.

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[2] Federal Highway Administration. *Economic Development History of State Route 99 in California*. Accessed 11/02/2005. <http://www.fhwa.dot.gov/planning/econdev/sr99ca.htm> Updated March 1, 2005.

Urbanized versus Rural Areas

Urbanized areas are defined by a population of 50,000 or greater as determined by the U.S. Census Bureau. Currently, nine urbanized areas are located along this stretch of Route 99, including: Bakersfield, Visalia, Fresno, Merced, Turlock, Modesto, Manteca, Stockton, and Lodi. Other cities will likely become urbanized and may be treated as urbanized rather than rural for some projects.

This is an important element to consider because different standards and treatments apply to urban and rural areas. Urban areas may typically have:

- Interchanges spaced closer together.
- More lanes to handle greater traffic volume and auxiliary lanes to help local and regional traffic merge on and off the freeway.
- More enhancements, such as soundwalls, fencing, and irrigated landscaping.
- A depressed or elevated road bed.
- More storage for storm water runoff.
- Greater emphasis on cross street sidewalks and lighting.
- Elements of Intelligent Transportation Systems, such as ramp meters and changeable message signs.

As project features are considered in later sections of this Business Plan, it is important that these distinctions be kept in mind.

2.2 Physical Characteristics and Issues

2.2.1 Highway Safety

Safety is the top priority of Caltrans and local governments and has been a major focus for the route. As an essential part of this effort, median barriers are used on Route 99 to prevent cross median accidents. Caltrans has a number of criteria to determine the appropriate location and type of median barriers. The primary criteria include accident history, median width, and traffic volumes. Much of Route 99 has median barriers in place, but many miles of median do not currently have barriers. A number of projects to install median barriers along the route are in the design or construction phase. These include stand-alone median barrier projects or other projects that include median barriers as one of the project features.

Standard types of median barriers for new installation are concrete safety-shaped barriers and metal thrie-beam barriers. Temporary concrete barriers may be used under certain conditions.

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Caltrans attempts to preserve the median oleander shrubs when barriers are installed. When this is not feasible, Caltrans provides mitigation in the form of adjacent landscaping; however, once the facility is upgraded to 6 lanes, preservation of the oleanders generally becomes impractical.

Removing or modifying fixed objects along the sides of the highway has increased safety significantly. This includes removing large metal sign posts, installing lighting and signs on bases that break away when they are hit, and removing other unyielding objects or adding barriers to absorb the energy of a collision. Removing roadside objects creates a clear recovery zone, which gives drivers who run off the road an opportunity to recover. Barriers, guardrails, and yielding roadside features reduce the severity of run-off-the-road accidents.

The principle of full access control is invaluable as a means of preserving the capacity of arterial highways and minimizing accident potential. As traffic volumes on Route 99 increase, at-grade intersections need to be removed in order to improve the safety and operation of the highway. Today, the closure of at-grade intersections or freeway gaps is particularly important because broadside accidents can lead to significant damage to the vehicle passenger compartment. In addition, at-grade intersections can result in acceleration or deceleration in the through lanes contributing to rear-end or sideswipe type accidents. Closing the remaining at-grade intersections has been included in programmed projects. These projects are defined in the fact sheets in Appendix A as Priority Category 1.

The SHOPP is the primary program for funding safety improvement projects. Freeway gap closures are typically funded from the STIP because the SHOPP is not sufficiently capable of funding these larger, more costly projects, and they typically do not meet SHOPP safety criteria.

The accident pattern on Route 99 shows a steady increase in the number of accidents per million vehicle miles for the last 10 years. This trend indicates that not only is the overall number of accidents increasing as ADT increases, the accidents per miles traveled are also increasing. The increase appears to primarily be congested related. This congestion related accident trend is beyond the ability or scope of the SHOPP to address and must be addressed by the STIP.

Safety Roadside Rest Areas

Providing safety roadside rest areas for fatigued drivers is an important part of Caltrans' safety efforts. Tired drivers and unsafe roadside parking are significant problems that can be reduced with adequate rest areas that include parking areas, drinking water, toilets, tables, benches, telephones, and information boards.

Today, there are three rest areas along this segment of Route 99. The Philip S. Raine and Chester H. Warlow rest areas are in Tulare County and the Enoch Christoffersen rest area is in Stanislaus County. According to the Rest Area Program guidelines, there should be no more than 60 miles

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between rest areas. With the exception of the distance between the Phillip S. Raine and Chester H. Warlow rest areas, the gap is much greater than this.

Existing rest areas are also severely under capacity, especially for trucks; this means that truck drivers may keep driving or park illegally along highway ramps.

2.2.2 Highway Capacity Needs

Reduced speeds and bottlenecks are indications that the current capacity of Route 99 is not adequate, especially during commute hours in urban areas. Some additional lanes have been added to Route 99, but congestion persists from increases in ADT, increases in traffic merging on and off the freeway, and a large percentage of truck traffic.

Capacity is affected by the number and width of lanes; the location, spacing, and type of interchanges; the presence and width of shoulders; the condition of the pavement; and gaps in the freeway system. Over the next 20 years, there will be a significant need to add lanes to Route 99; however, the ability to widen the route is hampered by available right-of-way and adjacent development.

2.2.3 Operational and Structural Needs

Freeway Gaps

Route 99 has segments that are not freeway. In these areas, there are at-grade intersections where traffic can enter, exit, or cross the highway. The remaining at-grade intersections are one of the most significant safety issues on the route. While there are projects programmed to eliminate these remaining gaps, some of these projects are many years in the future and are not yet fully funded.

Interchanges

Interchanges have a greater effect on the urban corridor than any other feature. An interchange allows high volumes of traffic to enter and exit the highway via ramps, and provides a grade separation between the highway and cross street. Many of the interchanges on Route 99 were built in the 1950's and 60's, and were designed for significantly lower volumes than those encountered today. Inadequate geometrics, as well as limited storage and merge distance all contribute to congestion on the ramps, local roads, and the highway itself. There is a need to modify or replace these interchanges to improve the safety and operation of the route; however, even minor modifications to interchanges on Route 99 may be limited by the State right-of-way and adjacent local development.

Inadequate spacing between interchanges can also affect the flow of traffic, especially during commute hours in urban areas. This leads to insufficient distances for vehicles to safely and efficiently merge on and off the highway, which in turn leads to congestion and increased accidents. Where substandard spacing exists, interchange spacing should be increased or other

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operational features, such as auxiliary lanes, constructed to decrease the merging conflicts and improve operations. This may result in closing some interchanges.

Pavement

Much of the pavement on Route 99 is 30 to 50 years old, and has already exceeded its design life, warranting reconstruction. While the statewide average for truck traffic is 9 percent, trucks make up as much as 27 percent of the traffic on Route 99. This extra stress on aged pavement, along with the lack of adequate funding to reconstruct the pavement, is the single most significant factor contributing to the current poor pavement conditions. Complete pavement reconstruction is the best long-term solution; however, the length of time it takes for reconstruction, which causes impacts such as traffic delays, and the high cost make this strategy problematic.

2.2.4 Highway Appearance

The appearance of Route 99 affects the quality of life for Valley residents and the perceptions of travelers, which can have an impact on the local economy. A visually appealing transportation corridor should either blend into or complement the landscape. The companion document to this Business Plan, the *Route 99 Corridor Enhancement Master Plan*, describes this connection between corridor appearance and quality of life in detail, so it will not be repeated here. A few key highlights are worth noting, however.

Highway Structural Themes

Over the years, incremental improvements to Route 99 have resulted in a variety of old and modern bridges, sign panels, landscape types, fences, and lighting fixtures. The lack of unified features has left the corridor with a diminished appearance and no community identity.

Soundwalls have also been added along the corridor to reduce noise, but many of them did not have screening vegetation planted and they have become a magnet for graffiti. Others need to be repaired or replaced.

Outside of Caltrans' right-of-way, abandoned buildings, billboards, junkyards, microwave towers, and trash create unsightly views for travelers. Communities can use tools such as zoning laws and other ordinances to help clean up these eyesores. At the same time, they can preserve old structures such as water towers and barns to create a more picturesque landscape.

Because Route 99 is the gateway to urbanized communities along the corridor, improving the appearance can help reinforce a community's identity and give travelers a good impression of the community, which in turn should improve local economies.

Planting Types

The roadsides along Route 99 include two types of planting—"Functional Planting" and "Highway Planting."

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"Functional Planting" is used in the rural segments of Route 99 and is made up mostly of the original planting along the corridor. The original plantings were composed of eucalyptus trees to frame the highway and oleander shrubs planted in the median to block the glare of oncoming headlights. Groundcover, planted as erosion control in rural areas, is mostly non-native grasses.

In recent years, many oleander plants, which came to symbolize Route 99, have been removed to make way for median barriers or additional traffic lanes. Many of the eucalyptus trees were also removed for similar reasons, or due to decay or safety issues.

"Highway Planting" is used in urban areas and goes beyond function to improve aesthetics. Highway planting includes trees, shrubs, and groundcovers watered by automatic irrigation systems. This landscaping also helps control dust, erosion, fire, and weeds. In addition, highway planting can help delineate the route, provide headlight screening, conceal eyesores next to Route 99, or conceal the roadway from the community.

Both of these landscape types suffer from a lack of adequate maintenance. Further, many of the areas with "Highway Planting" are old, antiquated, and difficult to maintain. Maintenance of the roadside is discussed later in this chapter.

2.3 Truck Traffic

Route 99 is a critical artery for goods movement in the State of California and the San Joaquin Valley, and it is important for the overall economic vitality of the State. It is known as a "Priority Global Gateway" for goods movement in the Global Gateways Development Program. Accordingly, truck traffic is playing an increasingly larger role in the transportation fabric of the valley.

Truck volumes on Route 99 in the San Joaquin Valley vary from 19 percent in Stanislaus and San Joaquin counties to 27 percent in Kern County. This is compared to the statewide average of 9 percent. Some examples of truck traffic impacts are:

- Lower capacity of the highway, contributing to congestion.
- Increased conflicts between slower-moving trucks and fast-moving cars.
- Distressed pavement conditions from the extra stress of the truck weight and numbers.
- More parking to accommodate the roadside rest requirements of trucks.
- Interchange upgrades to accommodate modern truck access.

According to a 2001 survey called the "California Heavy Duty Truck Travel Survey," 24 percent of truck trips are regional in nature or may stay in the county area, and 76 percent of truck trips

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are interregional or outside the county area. While this was a statewide study, it has direct application to the Route 99 corridor.

2.4 Maintenance of Route 99

Over the last five years, maintenance costs for highway elements including roadsides, pavement, bridges, guardrail, median barrier, signs, and delineation, have increased an average of 4 percent per year, while staffing resources have been reduced by 10 percent for the same time period. Along with an increase in inventory on Route 99 and other State routes, maintaining adequate appearance and condition ratings for the roadway is becoming increasingly difficult. Routine maintenance costs by State forces and highway maintenance contracts on Route 99 are projected to be $116 million over the next 10 years. The 10-year SHOPP indicates contracts expected to total nearly $376 million with the focus of the projects being split between rehabilitation and preventive maintenance projects. This investment is expected to provide highway appearance and condition ratings similar to current conditions, which are less than Caltrans performance targets and desires of the communities.

At a time when the inventory of highway pavement and roadside landscape miles are increasing, maintenance resources are decreasing. Maintenance efforts for safety and preservation items must take priority over maintenance efforts for appearance items. Keeping up the appearance and condition of aging highways and roadside facilities are becoming more difficult.

Roadbed Maintenance

Maintaining the integrity and serviceability of the pavement on Route 99 requires a continuous effort by maintenance forces. As rigid Portland cement concrete slabs become broken from truck traffic, they are patched temporarily until a Major Maintenance or SHOPP project can be designed and contracted to replace them. As flexible asphalt concrete (AC) pavement becomes distressed and deteriorates due to traffic, age, or storm damage; pothole filling, grader blankets, and other strategies are used as interim repairs until repaving or rehabilitation projects can begin.

Structures Maintenance

Bridge maintenance crews respond to a variety of bridge damage incidents on a weekly basis. Over-height loads and accidents on the mainline cause damage, as well as accidents on the bridge decks themselves. In some extreme cases, bridges have been closed and traffic detoured for long periods because of structural damage from accidents or deterioration of reinforced steel and other structural elements. Routine maintenance on bridges includes replacement of expansion joint material, repairing rails and fences, and patching spalled concrete.

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Traffic Control Elements

Traffic control elements including lighting, striping, signs, median barriers, guardrail, and fencing are maintained continuously on a routine basis and in response to incidents. Signs, light poles, and median barriers damaged by accidents are repaired as quickly as materials are available and resources allow. Maintenance of these elements requires specialized equipment and expertise.

Storm Maintenance

Route 99 storm-related maintenance activities involve drain cleaning and monitoring, patching quickly forming potholes in the distressed AC pavement sections, and grading shoulders to limit drop-offs between the pavement and the dirt shoulders. Maintenance patrol during storms is a routine practice.

Litter Collection

Roadside litter is a growing problem that significantly detracts from the appearance of the transportation facility. Caltrans uses a number of innovative programs to supplement its litter removal effort including:

- Adopt-A-Highway program, which uses volunteers to clean up litter. The program is in place along Route 99, but there are some gaps.
- Low-risk inmate and probationary crews supervised by law enforcement personnel to assist in litter and weed removal.
- California Conservation Corps crews, hired through intergovernmental contracts, to assist in litter and weed removal.

Graffiti Control

Reducing graffiti takes a quick response by maintenance staff, but in many areas, Caltrans is losing the battle. The only real solution is to provide planting in front of flat surfaces to deter graffiti.

Adopt-A-Soundwall is part of the Adopt-A-Highway program that provides volunteer labor to clean up graffiti. Currently, one soundwall in Stanislaus County has been adopted into this program.

Roadside Vegetation Management (Weed Control)

Vegetation along rural roadsides usually includes grasses and broad-leaved, non-woody plants used for erosion control following road construction. This vegetation is non-irrigated, but must be maintained to improve the appearance of the roadside, reduce fire risk, and maintain sight distances.

Caltrans primarily uses mowing and chemicals to control this vegetation. Since 1992, however, Caltrans has been reducing the use of chemicals. In 2000, a 50 percent reduction was met and by

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2012, the goal is to reduce chemical use by 80 percent. Since mowing is much more labor intensive than spraying, it will become increasingly difficult to adequately control weeds in the rural areas.

Maintenance of Highway Planting

Fully planted and irrigated urban landscaping along Route 99 requires ongoing, intensive maintenance. Landscape rehabilitation projects are developed to replace dead and dying landscapes and to make aging roadsides easier to maintain. These projects, however, must compete with pavement, operations, and safety projects, and due to funding limitations are currently not being constructed.

Each Landscape Maintenance worker should not be responsible for maintaining the landscape and controlling litter, weeds, and graffiti for more than 15 to 20 acres. The statewide average responsibility, however, is about 40 acres per worker. The staffing levels for landscape workers assigned to Route 99 are at the statewide average.

Annual Maintenance Costs

Appendix E contains a projection of the 10-year maintenance costs for the Route 99 corridor in Districts 6 and 10. These costs assume a rate of inflation of 3 to 5 percent per year. The tables show maintenance costs are significantly higher on the segments of the route in the urbanized areas. This is due to a number of factors, but the most critical are additional lanes, higher traffic volumes, and more landscaped acres. The projected costs assume that the route remains in its current configuration, that no new lanes or landscaping are added. In reality, as the projects presented in this document are built, these costs will increase. While some of the maintenance categories such as "Roadbed" may actually decrease due to new and rehabilitated pavements, this will be more than offset by increases in the other categories.

2.5 Environmental Resources

The San Joaquin Valley is rich in diverse natural habitats, cultural and historical resources, and fertile farmland. Improving Route 99 must be done in a way that protects these irreplaceable resources, as well as water and air quality. Noise is another environmental concern as urban areas along this route continue to grow and more housing is built close to Route 99.

Biological Resources

The valley grasslands, oak savannas, riverbanks, and freshwater marshes that travelers enjoy along Route 99 also provide habitat for wildlife. To survive, animal species such as the San Joaquin kit fox must be able to travel between these areas to find food, escape predators, and migrate with the seasons. Because of intense development, waterways are now the primary link between habitats. Since Route 99 crosses every major river between Bakersfield and Stockton, as well as many seasonal streams, it is vital that improvements to Route 99 also maintain or re-

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establish these links. This can be done by restoring riparian (riverbank) vegetation, stabilizing stream banks, eliminating exotic plants, and restoring stream habitats for aquatic species and migrating birds. Wildlife crossings are another important tool for the recovery of Valley species.

Cultural Resources

Before western settlement of California, the Valley was primarily inhabited by Native Americans known as Yokuts. While agriculture and the damming of rivers have altered the landscape, archaeological remains of Yokut villages may still lie intact near Route 99.

More recently, Route 99 and the history of the San Joaquin Valley paralle l the railroad tracks laid through the Valley in the 1870's. The railroad gave Valley farmers an efficient means to transport their goods to Los Angeles, San Francisco, and Sacramento. Cities such as Modesto and Fresno followed the arrival of the railroad, becoming the Valley's major population centers of the railroad era. Smaller towns also sprung up at railroad stops along the line. Today, signs of the area's history are apparent in the aging farmhouses and barns visible from Route 99. Even remnants of advertisements painted on barns during the early 1900's still exist to give us a glimpse into the past.

This historic landscape is threatened by development and advertising that may hide or even remove elements of the Valley's history. Preserving both archaeological and historic sites should be considered when planning any projects to improve Route 99.

Farmland

Fast-flowing water from the Sierra Nevada Mountains deposit mud, sand, and gravel when it reaches the flatter lands of the San Joaquin Valley, providing some of the most productive soil in the world. This fertile soil, along with a long growing season and a complex irrigation system, yields a diversity of crops that include: fruits, nuts, berries, cotton, and vegetables. Cattle, poultry, and dairy products are also produced in significant quantity.

Federally funded projects affecting prime and unique farmland are generally subject to the provisions of the Farmland Protection Policy Act.

Air Quality, Water Quality, and Noise

The San Joaquin Valley Air Basin, which is approximately 250 miles long and averages 35 miles wide, is the second largest air basin in the State. It is defined by the Sierra Nevada to the east, the Coast Ranges to the west, and the Tehachapi Mountains to the south. The bowl shape of the San Joaquin Valley contributes to its air pollution problem.

The main pollutants of concern are carbon monoxide, nitrogen dioxide, ozone, and particulate matter that is 10 microns in diameter or smaller (PM10). If a project is located in an area that has exceeded State or federal standards for these pollutants, additional air quality analysis and

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reduction measures for that pollutant are required. This is most frequently done for carbon monoxide and PM10.

Potential impacts to water quality are associated with the discharge of pollutants in storm water runoff from the highway. Pollutants commonly associated with highways are litter, heavy metals, petroleum hydrocarbons, brake materials, oil and grease, sediment, suspended solids, and pesticides and herbicides. Water Quality Assessments identify potential impacts on surface water and groundwater resources resulting from proposed projects and describe project design, procedures, and practices that would minimize these impacts.

Potential noise impacts from transportation projects are identified during the planning and design phase. A noise impact occurs when the projected noise levels, after a project is completed, result in a substantial increase in noise level (defined as a 12-decibel or more increase) or when the projected noise level with the project approaches or exceeds the noise abatement criteria. If it is determined that the project would have noise impacts, then potential abatement measures, such as soundwalls, must be considered.

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